

UPM BIOVERNO BIODIESEL

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Case Study Assignment

UPM BioVerno is a local, Finnish diesel fuel. It is derived from crude tall oil, a residue of UPM's own pulp production, which mostly originates from Finnish forests. UPM BioVerno makes it possible to achieve a remarkable reduction in greenhouse gas emissions compared to traditional fossil diesel. UPM BioVerno is derived from forest industry residues, which allow us to utilise wood materials with maximum efficiency. Unlike traditional biofuels, UPM BioVerno is derived from non-food materials instead of wasting food crops.

The use of softwood pulping (= cellulose production) by-product crude tall oil as biofuel raw material is suitable for Finland because Finland has plenty of cellulose production. The know-how of using cellulose and other wood process by-products is traditionally very high, so the use of pine oil as a biofuel raw material is only natural step to take.

UPM produces in Finland annually about 2 200 000 tons cellulose and the UPM's annual need of wood equals to 13 million m³. The capacity of UPM BioVerno production is about 120 million litres which equals about 114 000 tonnes.

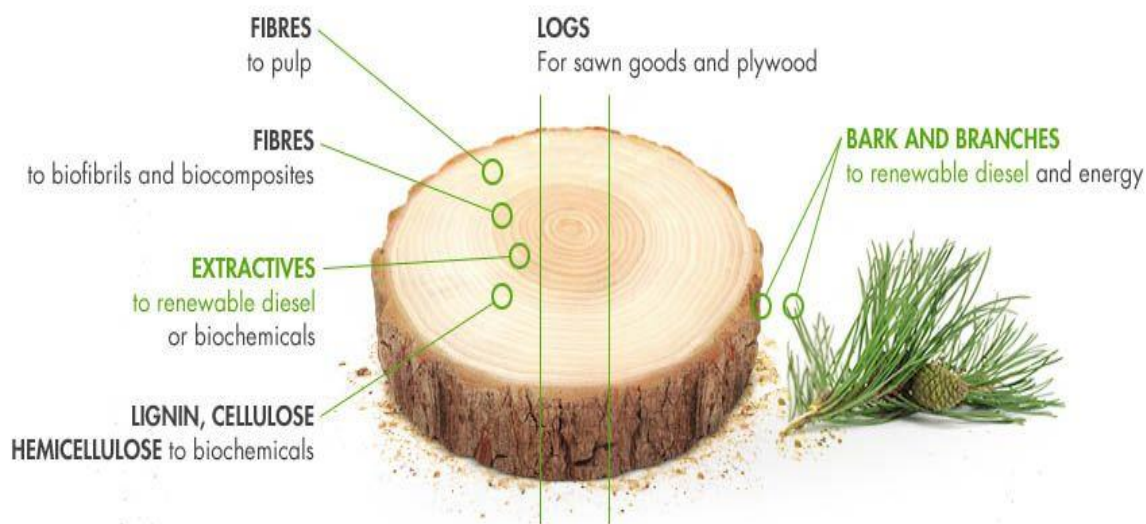


Fig. 1. Renewable biofuel production using pine tree as raw material

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Making one ton of cellulose creates about 35 kg of tall oil and it requires about 6 m³ of pinewood. One m³ of pinewood equals therefore about 6 kg crude tall oil and the full production capacity needs the crude tall oil of 19 million m³ of pinewood. The annual growth of pine is in Finland about 48 million m³. The need for diesel fuel in Finland is about 2,5 million tonnes per year so the UPM BioVerno production could meet only about 5% of the total need.

What are the challenges of biofuel producers in the Local / European / Global markets

Search for new technologies of renewable energy sources are a result of the challenges associated with the need to reduction of CO₂ emissions and a reduction of fossil fuel extraction. The energy of biofuels in comparison to other forms renewable energy (photovoltaic, solar collectors, energy wind or tidal) can be used in transport and easily stored. During production of biofuels from agricultural biomass important is the policy of sustainable use of raw materials. Also it should not affect to security of food production system.

The regulation EU on fuel quality and renewable energy, biofuel producers listed the following challenges:

- Increasing energy efficiency by 20 % until 2020.
- Reduction in greenhouse gas emissions by 20 % until 2020.
- Increasing the share of renewable energy in final energy consumption up to 20 %
- Reduce the proportion of energy acquired from biofuels of agricultural origin, used in transport to 10 %.

The challenges of biofuel producers

Biofuels should be good for environment and those are part of sustainable life cycle. However, the production of biofuels, a number of problems, which are the most active producers do not want to see and understand. At worst, biofuel production contributes to climate change than fossil fuels and at the same time causing the loss of biodiversity and the destruction of the world's diverse regions. Biofuels are a good thing in itself, but must ensure that the biofuels to turn its original objectives. Palm oil is currently the most controversial and criticized biofuel raw material.

The usage of tropical rainforest areas for palm oil production has caused and will cause not only a massive biodiversity endangerment but also significant greenhouse gas emissions. The potential biodiesel customer may also consider this kind of undesired aspects and therefore refuse to use biodiesel.

The lack of biofuel infrastructure and distribution is another problem. The price of biodiesel shouldn't be much more than normal fossil diesel. Raw material biomass can also be used for alternative purposes like chemical industry raw material or heating fuel and this competes with the production of biodiesel.

How well the UPM BioVerno production meets the sustainability challenge?

Sustainability criteria for renewable energy resources according to the EU directive 17 (article 2-6) are:

1. Reduction in the use of biofuels in greenhouse gas emissions must be at least 35 %.
2. Biofuels shall not be made from raw material, which has been acquired biodiversity a rich land-based sources (primary forest and other wooded land, a natural reserve, biodiverse grass area).
3. Biofuels shall not be made from raw material obtained from land to which is bonded a lot carbon (wetland, forested areas, peatland).
4. The production of biofuels, and agricultural raw materials must meet the the minimum good agricultural and environmental conditions which are regulated.

BioVerno meets criterion 1, carbon foot print is 80 % less than in case of fossil diesel. BioVerno is produced from waste so it meets also criteria 2 and 3. Criteria 4 is also covered, because in Finland the law stipulates that a new forest must be planted to replace the harvested one. According to these facts it can be said that BioVerno is a sustainable choice.

The significance of biofuels in the future?

The European Union has made significant initiatives to support the usage of renewable energy sources. By 2020 the EU requires that at least 10 % of fuel used in transport should be biofuel. And as practically all the heavy transport vehicles use diesel fuel there is a growing need for biodiesel. It is evident that the total development of production and applicability of biofuel in EU should grow up.

Conclusion

BioVerno is an interesting product but it can use only together with large scale pine cellulose production. Because the BioVerno production quantity is currently not enough to serve all of the diesel cars in Finland it cannot be an export product. There should be another diesel biofuel selection also available in order to serve all of the diesel cars in Finland. Countries without cellulose production plants have to select another kind of biodiesel or biofuel solution.

Large distribution of the biofuel energy has challenges in existing network infrastructure in EU because of lack of investing. Some of the EU countries still struggling with financial problems. This might slow down promoting of biofuels generally.

The growing need for traffic fuels and dwindling fossil fuels reserves are leading inevitably to higher fossil fuel prices in the next 15-20 years. In addition, when the international, EU and national level environmental laws, rules and sustainability regulations are increasingly tightening, investing into greener and sustainable fuel alternatives would be the right and profitable choice.

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